

UNIVERSITY OF MIAMI RADIOCARBON DATES VI

J J STIPP, K L ELDRIDGE, and R CADWELL

Department of Geology, University of Miami, Coral Gables, Florida

The following radiocarbon measurements are a partial list of projects and samples dated since the Spring of 1975. The technique used is liquid scintillation counting of wholly synthesized benzene as indicated in R, v 16, p 402-408. The intermediate chemical step of converting CO₂ to Li₂C₂ has been modified so that the CO₂ is reacted with the lithium metal at a temperature of 950° to 1000°C instead of the 600°C as formerly done (Tamers, 1975). This modification has had the effect of reducing occasional variable losses in conversion yields in this step, and reducing the reaction time required from 30 min to 10 min for a typical ¼ mole sample. Dates are calculated using a ¹⁴C half-life of 5568 yr and errors are reported as one standard deviation. No other correction factors are applied.

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SAMPLE DESCRIPTIONS

I. ARCHAEOLOGIC SAMPLES

A. United States

Arch Creek Shell Midden series

Shell and charcoal samples from Arch Creek site, Dade Co, Florida (25° 08' 17" N, 80° 10' 55" W). Dates period of midden use by early Florida Indians (R, v 16, p 403-404). Coll July 1975 by R Carr, Florida Div Archives, Tallahassee, Florida; subm July 1975 by W Coleman, Miami West India Archeol Soc, Miami, Florida.

UM-617. Arch Creek 2	1730 ± 80 AD 220
Shell (<i>Strombus gigas</i>) from S wall of Pit E55/S13 at 47cm depth.	
UM-618. Arch Creek 3	1360 ± 80 AD 590
Shell (<i>Strombus gigas</i>) from E wall of Pit E55/S13 at 18cm depth.	
UM-619. Arch Creek 7	2320 ± 80 370 BC
Charcoal from floor of Pit E65/S12 at 25 to 35cm depth.	
UM-620. Arch Creek 9	2250 ± 90 300 BC
Charcoal from floor of Pit E70/S12 at 25cm depth.	

Wightman series

Shell and charcoal samples from shell mound of Wightman Site I, Sanibel I., Florida (26° 28' 18" N, 89° 09' 16" W). Coll and subm 1975 by R H and H H Cadwell.

General Comment (RHC): results indicate a shell mound constructed at different times over a midden. Variation in periods of occupation possibly resulted from sea level fluctuations.

- | | |
|---|-------------------|
| | 1240 ± 90 |
| UM-478. Wightman A-1 | AD 710 |
| <i>Busycon contrarium</i> from 0 to 46cm below surface of mound within Grid A. | |
| | 1700 ± 60 |
| UM-480. Wightman A-2 | AD 250 |
| <i>Busycon contrarium</i> from 46 to 92cm below surface of mound within Grid A. | |
| | 1580 ± 70 |
| UM-481. Wightman A-3 | AD 370 |
| <i>Busycon contrarium</i> from 92 to 138cm below surface of mound within Grid A. | |
| | 2250 ± 80 |
| UM-477. Wightman A-3 and A-4 combined | 300 BC |
| Charcoal from 92 to 184cm below surface of mound within Grid A. | |
| | 2050 ± 160 |
| UM-482. Wightman A-4 | 100 BC |
| <i>Busycon contrarium</i> from 138 to 184cm below surface of mound within Grid A. | |
| | 2330 ± 100 |
| UM-483. Wightman A-5 | 380 BC |
| <i>Aequipecten irradians</i> from 184 to 230cm below surface of mound within Grid A. | |
| | 2830 ± 80 |
| UM-484. Wightman A-6 | 880 BC |
| <i>Area ponderosa</i> from 230 to 276cm below surface of mound within Grid A. | |
| | 1370 ± 90 |
| UM-487. Wightman F-8 | AD 580 |
| Charcoal from 322 to 368cm below apex of mound within Grid F. | |
| | 2110 ± 50 |
| UM-370. Indiantown Sand Mounds | 160 BC |
| Charcoal from 60cm beneath surface of sand mound, Indiantown, Florida (27° 02' 20" N, 80° 34' 31" W). Coll 1974 by M Andrejko; subm 1974 by R Williams, Dept Anthropol, Univ South Carolina. <i>Comment</i> (RW): result used to date bundle burial and early habitation. | |

Cannon's Point series

Shell and wood samples from shell ring, Cannon's Point, St Simon's Island, Glynn Co, Georgia (31° 16' 30" N, 82° 20' 10" W). Coll 1973-75 and subm 1975 by R Marrinan.

UM-523. Cannon's Point 2 **3600 ± 110**
1650 BC

Oyster shells from sub-midden humus of Unit Test I in W ring (9GN76) 12 to 20cm below surface. *Comment* (RM): dates last occupation of site.

UM-521. Cannon's Point 1 **3760 ± 90**
1810 BC

Oyster shells from Unit 18N, 3E at 20cm depth. *Comment* (RM): dates last occupation of site.

UM-522. Cannon's Point 3 **3860 ± 90**
1910 BC

Oyster shells from lower level of Unit Test I, W ring (9GN76) 45 to 55cm below surface. *Comment* (RM): dates initial occupation of site.

UM-520. Cannon's Point 5 **4190 ± 90**
2240 BC

Oyster shell from base of midden deposit 1.47m below surface. *Comment* (RM): dates initial occupation of shell ring and assoc human skeletal material.

UM-519. Cannon's Point 6 **2770 ± 90**
820 BC

Wood from excavation Sq 27S, 18E, 3.55m below marsh surface, outside of shell ring. Dates transitional period from fiber-tempered ceramics to Deptford ceramics.

UM-518. Cannon's Point 7 **2780 ± 80**
830 BC

Wood from submarsh floor Excavation Sq 33S, 12E, 3.36 to 3.47m below marsh surface. *Comment*: similar to UM-519.

*B. Ecuador***Arajuno series**

Human bones and skull from grave sites, SE Amazon, Ecuador (1° 10' 00" S, 78° 20' 03" E). Coll 1972 and subm 1975 by P G Turolla.

UM-421. Arajuno Site 1 **Modern**

Human bones from 3m below surface. *Comment* (PGT): assoc with carved stone artifact. Estimated age: Paleo-Indian. *Comment* (JJS): inorganic fraction.

UM-422. Arajuno Site 1 **690 ± 90**
AD 1260

Collagen fraction of UM-421.

UM-423. Arajuno Site 2 **Modern**
Human skull from 5m below surface. *Comment* (PGT): considered Neo-Indian. *Comment* (JJS): inorganic fraction.

UM-424. Arajuno Site 2 **1650 ± 70**
Collagen fraction of UM-423. **AD 300**

C. Guatemala

Monte Alto series

Two charcoal samples from artificial fill under 'Pot Belly' statue, Finca Monte Alto, La Democracia, Guatemala (14° 13' 20" N, 90° 56' 30" W). Coll 1970 and subm 1974 by E M Shook, Antigua, Guatemala. *General Comment* (EMS): samples are possibly from cooking or pottery making fires. Age of this culture is difficult to determine since assoc of monuments and pottery are not indigenous to area of find. Results indicate emplacement of statuary during Pre-Classic era. Emplacement corresponds chronologically with 'Pot Belly' emplacement at Finca Santa Leticia, El Salvador (R, v 18, p 116).

UM-389. Monte Alto M44 W to Z **2450 ± 90**
500 BC

UM-621. Monte Alto M8 K3 **2020 ± 70**
70 BC

D. Honduras

Port Royal series

Two samples from each of 2 shipwrecks (PR1 & PR4) lying underwater at E end of Port Royal Bay, Isla de Roatan, Islas de la Bahia, Honduras (16° 24' 20" N, 86° 15' 26" W). Coll and subm 1975 by J E Hall, Dept Anthropol, Univ Miami.

General Comment (JEH): wrecks were covered with sand and turtle grass in water depth ca 9m. Ships were thought to pre-date Columbus, AD 1492.

UM-625. Port Royal PR1-6 **230 ± 70**
Charcoal from front hold sec. **AD 1720**

UM-626. Port Royal PR1-7 **260 ± 60**
AD 1690

Carbonized wood from front hold sec. *Comment* (JJS): average age for UM-625 & UM-626 is 245 ± 45. Samples from same wreck were previously dated by Pennsylvania (R, v 16, p 23).

UM-622. Port Royal PR4-1 **130 ± 60**
Wood sample from Sec 13G thought to be centerboard. **AD 1820**

UM-623. Port Royal PR4-1 **150 ± 50**
AD 1800

Comment (JJS): duplicate run of UM-622. Average age is 140 ± 40.

UM-624. Port Royal PR4-2 **Modern**

Wood sample taken from Sec 15G thought to be centerboard.

II. GEOLOGIC SAMPLES

A. United States

Caesars Creek Bank series

Shell samples from 2 piston cores in .7 to 1m water, Caesars Creek Bank, Biscayne Bay, Florida. Combined carbonate mudbank and tidal flats assoc with major tidal pass between Biscayne Bay and inner-reef tract SE coast of Florida. Dates depositional sequence of bank. Coll and subm 1975 by E R Warzeski, RSMAS, Univ Miami. Core 674 from (25° 23' 53" N, 80° 13' 01" W). Core 575 from (25° 22' 53" N, 80° 12' 56" W). See also (R, v 18, p 117-119).

UM-552. Core W-674-1D **4210 ± 140**
2260 BC

Assorted shells (primarily *Modiolus americanus*), 428 to 448cm below sediment surface.

UM-553. Core W-674-1E **5480 ± 140**
3530 BC

Assorted shells (primarily *Anodontia alba*, *Astrea tecta americana*), 400 to 440cm below sediment surface.

UM-525. Core W-575-1A **4220 ± 110**
2270 BC

Large mollusk shells (*Laevicardium laevigatum*, *Astrea phoebia*, and *Tellina lineata*), 390 to 420cm below sediment surface.

UM-526. Core W-575-1B **4230 ± 140**
2280 BC

Small mollusk shells, bivalves and gastropods, 380 to 420cm below sediment surface.

UM-551. Core W-575-1C **5120 ± 140**
3170 BC

Assorted shells (primarily *Modiolus americanus* and *Astrea phoebia*), 440 to 455cm below sediment surface.

Shackleford Banks series

Samples from split-spoon cores on Shackleford Banks, Carteret Co, North Carolina, between (34° 39' 28" N, 76° 33' 50" W) and (34° 41' 07" N, 76° 38' 45" W). Coll 1973 and subm 1975 by K Susman, Duke Univ. See also (R, v 17, p 239).

General Comment (KS): dates stratigraphic sequence and local buried geomorphic features for Shackleford Banks.

- UM-576. Shackleford Sh-3,18** >**36,320**
Mercenaria shells from 20.8m depth. *Comment* (KS): may be part of a Tertiary lag erosion surface.
- UM-581. Shackleford Sh-4,14** **14,880 ± 570**
12,930 BC
Nuculana, *Arca*, and *Mulinia* shells from 15.2 to 15.8m depth. *Comment* (KS): mud sediment lies below sand recognized as inlet-filling sand. Question was whether this is Holocene transgression or Wisconsin mud.
- UM-577. Shackleford Sh-5,20** **23,590 ± 620**
21,640 BC
 Shell of unid. species in fine sand at 23.2m depth. *Comment* (KS): underlies a semi-indurated (Tertiary?) limestone.
- UM-579. Shackleford Sh-8,13** **25,000 BC**
Mulinia, *Crassostrea virginica*, and *Arca* shells. *Comment* (KS): in sandy, silty clay believed to be a Pleistocene backbarrier sediment.
- UM-582. Shackleford Sh-8,18** >**35,590**
Mercenaria shell from 22.7m depth. *Comment* (KS): helps date clay units that bracket shell-and-pebble lag.
- UM-574. Shackleford Sh-11,7** **470 ± 60**
AD 1480
 Peat. *Comment* (KS): located in what should be outcrop of marsh peat on front of barrier island.
- UM-580. Shackleford Sh-11,16** **27,330 BC**
Mulinia, *Tegolus*, and *Arca* shells. *Comment* (KS): thought to be Pleistocene backbarrier bay mud.
- UM-578. Shackleford Sh-13,14** **11,270 ± 170**
9320 BC
 Unid. shell from 14m depth in matrix of sand. *Comment* (KS): part of a beach or inlet sequence.
- UM-575. Shackleford Sh-13,19** **11,340 ± 130**
9390 BC
 Unid. shell species from depth 21.6m. Matrix of sand. *Comment* (KS): thought to be former channel fill.

New Jersey Shelf series

Samples cored on secs of New Jersey shelf. Coll June 1974 by G L Freeland; subm Dec 1974 by WL Stubblefield, NOAA, Miami, Florida.

- UM-416. New Jersey Shelf, 1A-V6-50** **510 ± 70**
1440 BC
 Shell material near shore from depth 50cm (39° 25' N, 74° 20' W). *Comment* (WLS): to date late aggradation of flank of inner ridge crest.
- UM-417. New Jersey Shelf, 1A-V6-563-573** **670 ± 70**
AD 1280
 Shell material from 563 to 573cm depth in actively reworked Holocene sand on inner ridge crest (39° 25' N, 74° 20' W). *Comment* (WLS): dates ridge aggradation.
- UM-412. New Jersey Shelf, 1B-V5-35** **3980 ± 600**
2030 BC
 Shell material from 35cm depth in hydraulically active Holocene sediment (39° 08' N, 74° 35' W). *Comment* (WLS): late ridge aggradation in central ridge/swale system.
- UM-418. New Jersey Shelf, 1B-V7-60** **5600 ± 130**
3650 BC
 Shell hash from 60cm depth in hydraulically active Holocene sediment (39° 08' N, 74° 05' W). *Comment* (WLS): represents later flank aggradation on central shelf ridge.
- UM-415. New Jersey Shelf, 1B-V7-221** **4370 ± 250**
2420 BC
 Shell material from 221cm depth in recent Holocene sediment (39° 08' N, 74° 05' W). *Comment* (WLS): results determine amount of flank aggradation.
- UM-414. New Jersey Shelf, 1B-V9-20** **800 ± 60**
AD 1150
 Shell material from 20cm depth in central shelf trough (39° 08' N, 74° 05' W). *Comment* (WLS): expected to date development of sand ridges on inner central shelf.
- UM-413. New Jersey Shelf, 1B-V10-2** **2070 ± 130**
120 BC
 Shell material from 2cm depth in hydraulically active substrate from Holocene lagoon (39° 08' N, 74° 05' W). *Comment* (WLS): dates base of a ridge system.
- UM-419. New Jersey Shelf, 1B-V10-40** **3980 ± 190**
2030 BC
 Shell material from 40cm depth in Pleistocene sand of central trough area (39° 08' N, 74° 05' W). *Comment* (WLS): lower constraining date of Holocene lagoonal sediment.

Angelfish Creek series

Peat sequence from vertical exposure in wall of tidal pass, N Florida Keys, Florida (25° 20' N, 80° 17' W). Coll 1975 by R B Halley; subm 1975 by E A Shinn, USGS, Fisher I. sta, Miami, Florida.

UM-584.	Angelfish Creek, 100cm	2090 ± 90 140 BC
UM-585.	Angelfish Creek, 150cm	2650 ± 90 700 BC
UM-586.	Angelfish Creek, 200cm	2850 ± 60 900 BC
UM-587.	Angelfish Creek, 250cm	3170 ± 70 1220 BC
UM-588.	Angelfish Creek, 300cm	3710 ± 70 1760 BC
UM-589.	Angelfish Creek, 350cm	3970 ± 100 2020 BC
UM-590.	Angelfish Creek, 400cm	4670 ± 70 2720 BC
UM-591.	Angelfish Creek, 450cm	4150 ± 150 2200 BC
UM-592.	Angelfish Creek, 480cm	4220 ± 80 2270 BC
UM-593.	Angelfish Creek, 490cm	4800 ± 100 2850 BC

Sands Cut series

Peat sequence from vertical exposure in channel wall at Sands Cut, N Florida Keys, Florida (25° 28' N, 80° 10' W). Coll 1975 by R B Halley; subm 1975 by E A Shinn. Fisher I. sta.

General Comment (EAS): dates sea level change.

UM-607.	Sands Cut, 0cm	360 ± 60 AD 1590
UM-608.	Sands Cut, 10cm	4160 ± 140 2210 BC
UM-609.	Sands Cut, 50cm	4080 ± 90 2130 BC
UM-610.	Sands Cut, 100cm	3980 ± 80 2030 BC
UM-611.	Sands Cut, 150cm	2580 ± 70 630 BC
UM-612.	Sands Cut, 200cm	2530 ± 80 580 BC

UM-613. Sands Cut, 200cm **1740 ± 60**
AD 210

UM-594. Fort Lauderdale Reef **2580 ± 60**
630 BC

Coral (*A palmata*) sawed from dead sec of reef in 4.5m water off coast of Fort Lauderdale, Florida (26° 08' 15" N, 80° 05' 05" W). Coll 1975 by W Raymond, Britt Assocs, Miami; subm 1975 by E A Shinn. *Comment* (EAS): result to determine when this major reef builder died in area N of Miami. Estimated age: < 200 yr.

B. Martinique, West Indies

Mt Pelée series

Charcoal from pyroclastic surge sediments near Mt Pelée, Martinique, West Indies. Dates used to determine frequency of cyclic eruptions on Mt Pelée. Coll and subm by J Roobol and A L Smith, Univ Puerto Rico at Mayaguez.

UM-376. Pelée 211 **2670 ± 70**
720 BC

Sample in block ash sediment in rd sec near Fond Labour, SE side of Mt Pelée (14° 48' 26" N, 61° 05' 51" W).

UM-377. Pelée 332 **5190 ± 90**
3240 BC

Sample from dense laval in rd sec near Rivière Calava, SW Mt Pelée (14° 46' 22" N, 61° 08' 47" W).

UM-378. Pelée 332 **5310 ± 120**
3360 BC

Duplicate run of UM-377. *Comment* (JJS): average age of UM-377 and -378 is 5250 ± 70.

UM-379. Pelée 331 **8400 ± 210**
6450 BC

Sample from block and ash sediments in rd cut near Rivière Balisier (14° 46' 33" N, 61° 08' 45" W). *Comment* (ALS): important in correlating complex sequence of surge and pumice flow sediments from S Pelée.

UM-380. Pelée 381 **440 ± 120**
AD 1510

Sample from block and ash sediment of limited areal extent. Forms low banks in river bed, middle sec Rivière des Pères (14° 46' 54" N, 61° 10' 00" W). *Comment* (ALS): possibly represents latest prehistoric eruption.

UM-382. Pelée 381 **540 ± 110**
AD 1410

Duplicate run of UM-380. *Comment* (JJS): average age of UM-380 and -382 is 490 ± 80 yr.

- 1040 ± 90**
AD 910
- UM-381. Pelée 448**
Sample from dense lava surge deposit, cliff sec, lower part of gorge of Rivière Claire (14° 46' 09" N, 61° 11' 42" W).
- 4020 ± 80**
2070 BC
- UM-410. Pelée 455**
Sample from block and ash sediments, cliff sec, lower part of gorge of Rivière Claire (14° 46' 46" N, 61° 11' 09" W).
- 3990 ± 80**
2040 BC
- UM-411. Pelée 455**
Duplicate run of UM-410. *Comment* (JJS): average age of UM-410 and -411 is 4005 ± 57 yr.
- 25,120 ± 450**
23,170 BC
- UM-383. Pelée 302**
Sample from block and ash sediment, cliff sec in lower part of Rivière Precheur (14° 48' 18" N, 61° 13' 26" W). *Comment* (ALS): stratigraphically one of oldest deposits containing carbon.
- 2470 ± 80**
520 BC
- UM-384. Pelée 450**
Sample from pumice flow cloud deposit, in rd to Morne Cocos (14° 49' 09" N, 61° 13' 39" W). *Comment* (ALS): important for stratigraphy of NW sector of Mt Pelée.
- 2430 ± 80**
480 BC
- UM-385. Pelée 450**
Duplicate run of UM-384. *Comment* (JJS): average age of UM-384 and -385 is 2450 ± 57 yr.
- +2350**
36,100
-3340
- UM-386. Pelée 388A**
Sample from dense lava surge deposit in rd cut between Anse Belloville and Anse Ceron (14° 49' 13" N, 61° 13' 53" W).
- 7410 ± 130**
5460 BC
- UM-387. Pelée 344**
Sample from pumice flow sediment in cliff sec near Macouba, Martinique (14° 50' 14" N, 61° 09' 08" W). *Comment* (ALS): only carbon sample from E side of volcano.
- 2150 ± 70**
200 BC
- UM-426. Pelée 222**
Sample from pumice flow sediment in cliff sec, lower part of Rivière Pointe la Mare (14° 46' 57" N, 61° 12' 50" W). *Comment* (ALS): one of most important pumice flow sediments on W Pelée.

- UM-427. Pelée 245** **4230 ± 120**
3280 BC
Sample from block and ash sediment on rd between Pointe La Mare and Le Precheur (14° 47' 36" N, 61° 13' 25" W). *Comment* (ALS): important in determining stratigraphy of older deposits on W.
- UM-428. Pelée 310** **20,240 ± 610**
18,290 BC
Sample from block and ash sediment in cliff alongside rd between Le Precheur and Anse Belleville (14° 48' 23" N, 61° 13' 52" W).
- UM-429. Pelée 311** **24,550**
+1200
-1420
22,600 BC
Sample from pumice flow in cliff and gully sec along rd immediately N of Le Precheur (14° 48' 20" N, 61° 13' 50" W).
- UM-430. Pelée 410** **310 ± 60**
AD 1640
Sample from block and ash sediment in S bank near mouth of Rivière des Pères (14° 45' 12" N, 61° 11' 03" W).
- UM-431. Pelée 439** **2560 ± 70**
610 BC
Sample from pumice flow cloud deposit in quarry on S bank near mouth of Rivière Seche (14° 45' 43" N, 61° 11' 43" W). *Comment* (ALS): important for correlation of late-prehistoric pumice flow sediments. UM-432 in sediment below but separated by marked unconformity.
- UM-432. Pelée 440** **3940 ± 80**
1990 BC
Sample from dense lava surge sediment in quarry on S bank near mouth of Rivière Seche (14° 45' 43" N, 61° 11' 43" W). See also UM-431.
- UM-433. Pelée 446** **1140 ± 70**
AD 810
Sample from thick airfall sediment in cliff sec, upper part of Rivière Seche (14° 47' 11" N, 61° 10' 46" W). *Comment* (ALS): only carbon obtained from an airfall sediment.

REFERENCES

- Eldridge, K L, Stipp, J J, and Cohen, S J, 1975, University of Miami radiocarbon dates III: Radiocarbon, v 17, p 239-246.
- Eldridge, K L, Stipp, J J, and Hattner, J, 1975, University of Miami radiocarbon dates V: Radiocarbon, v 18, p 116-124.
- Lawn, Barbara, 1974, University of Pennsylvania radiocarbon dates XVII: Radiocarbon, v 16, p 231.
- Stipp, J J, Eldridge, K L, Cohen, S J, and Webber, K, 1974, University of Miami radiocarbon dates I: Radiocarbon, v 16, p 402-408.
- Tamers, M A, 1975, Chemical yield optimization of the benzene synthesis for radiocarbon dating: Internatl Jour Appl Rad & Isotopes, v 26, p 676-682.